DOCUMENT RESUME

ED 268 793 FL 015 609

AUTHOR Niemi, Jussi; Koivuselka-Sallinen, Paivi
TITLE Neurolinguistic Aspects of Finnish Posterior Aphasia.
PUB DATE 85
NOTE 9p.; In: Neurolinguistic Papers: Proceedings of the Finnish Conference of Neurolinguistics (2nd, Joensuu, Finland, May 31-June 1, 1985); see FL 015 600.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Aphasia; Case Studies; *Error Patterns; *Finnish; *Morphology (Languages); *Neurolinguistics; *Phonology; Vocabulary Skills
IDENTIFIERS *Neologism

ABSTRACT

Examination of the lexical errors (phonological paraphasias and neologisms) of two posterior aphasic patients who are speakers of Finnish, a highly synthetic language, revealed that the lexical difficulties generally typical of posterior aphasics were found in these patients as well. The typical lexical difficulties clustered around open class words such as nouns, verbs, and adjectives. In such patients phonological paraphasias make up 60 percent of the errors. The results of this study show that posterior aphasia patients exhibit more errors toward the end of words, peaking around the 4th to 6th phoneme. In addition, the data suggest that paraphasias tend to occur after word formation rules have been applied and that neologisms are probably formed before application of word formation rules. The patterns of morphosyntactic marker errors also suggest that surface case marking carries some consistent deviations. The limited usefulness of the traditional one-component view of phonology is emphasized, and it is proposed that the formal aspect of words can be maltreated at various stages of language production. (MSE)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

NEUROLINGUISTIC ASPECTS OF FINNISH POSTERIOR APHASIA

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

J. Tommola

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Jussi Niemi
and
Päivi Koivuselkä-Sallinen
University of Joensuu

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED268793

FL 015 609

1. INTRODUCTION

The present exposition will deal with some aspects of posterior aphasic narratives. More specifically, we will discuss the repercussions of posterior errors on the lexical structure in a highly synthetic language, viz., in Finnish. (A more extensive analysis of the present speakers' lexical deviations will appear in Niemi et al., forthcoming.)

For the present purposes we will classify the lexical errors rather traditionally as phonological paraphasias and neologisms (see e.g. Butterworth 1979, 1985 for a critique). In that analysis, our major point of interest will be the susceptibility of error location to word and morpheme boundaries. Another main feature of the present exposition will be the fate of the surface case suffixes in posterior narratives.

2. PARAPHASIAS

2.1. Distribution of Lexical Deviations

We will use the distribution patterns of the lexical errors of the two patients as indicates of the linguistic comparability of their outputs (for neuropsychological and neurological data, see Niemi et al., forthcoming). The distributions of the patients' lexical deviations are similar (Table 1). There the phonological paraphasias make up some 60 per cent of the errors, jargon about 20 and the remaining classes, semantic jargon, formal paraphasias, semantic as well as formal cum semantic paraphasias share the remaining 20 per cent of the cases more or less evenly.

BEST COPY AVAILABLE

Table 1. Distribution of lexical deviations (in per cent)

	Phonological paraphasia	Jargon	Semantic jargon	Formal	Semantic	Formal cum semantic
P1 (N=942)	59	21	6	4	6	4
P2 (N=86)	58	22	4	2	1	13
Is product a lexical item?	NO 80 %			YES 20 %		

The lexicality of the product that has been used here is a tricky question theoretically, since the apparent similarity of the word of the aphasic to an item in the nonpathological lexicon may be an end product of various processes (see Buckingham and Kertesz, 1976) and what is more important still, the homophonicity may be totally unintended by the speaker. Since lexical distortions as such will not be our main concern in the present context we will discard the discussion of their internal subdivision here completely.

2.2. Lexical Structure and Phonological Paraphasias

The lexical difficulties typical of posterior patients usually gather around open, or major class words, such as nouns, verbs and adjectives, while the closed class items, e.g. pronouns and conjunctions, are less severely impaired (see e.g. Marin et al. 1976, O'Connell 1981, Buckingham and Kertesz 1976). This has been taken to imply a partition of the mental lexicon along these lines. (See, however, Ellis et al. 1983 who claim that the frequency of occurrence is a major factor here.) The open vs. closed class difference is also to be seen in our corpus, where about 4 per cent of the running open class words contain a phonological paraphasia, while less than one per cent of the closed class words share the same fate (see Table 2).

BEST C

Table 2. Phonological paraphasias in open vs. closed class words (per cent running words).

	Open	Closed	Total No. Running Words
P1	4.0	0.6	12027
P2	3.6	0.3	2090

The anomic component characteristic of posterior aphasia is to be observed in the prevalence of phonological errors in nouns vis-à-vis verbs (Table 3).

Table 3. Incidence of phonological paraphasias in nouns and verbs (per cent running words).

	Nouns	Verbs
P1	8.6	2.2
P2	8.7	2.5

2.3. Position of Phonological Paraphasias in Words

Posterior aphasics seem to differ from Broca's speakers in the location of the phonological paraphasias within words. Broca's speakers have more difficulties with the initial segments of words, and in a language like Finnish where the syllable is a significant structural unit, they show a relatively copious number of syllable initial paraphasias. (Niemi et al. 1985.) These difficulties of the anterior patients with initial segments of linguistic units are compatible with the observations that state that they have difficulties in shifting from one act to another (see e.g. Goodglass 1976). The present results show that posterior patients exhibit more errors towards the end of words (Figure 1). Note also that these type of patients also exhibit a similar pattern in the textual aspects of their speech where a discourse may begin in a coherent manner but will often eventually dissolve, perhaps due to failures in lexical retrieval.

A detail that is interesting in Figure 1 where the position of the phonological paraphasias in words is displayed is that the number of errors tends to have a peak

OPY AVAILABLE

around the 4th to 6th phoneme. Observe that the average length of words in the present data is 6.4 phonemes. Moreover, since we know that most Finnish words carry inflexions that are usually 1 to 3 phonemes in length, it may be that the high fall of the curves in Figure 1 may coincide with the boundary of the stem and suffix(es). That is, we could maintain that phonological paraphasias arise from errors in morpheme selection, rather than from errors in the execution of phonological words. That lexical classes are certainly somehow involved in these paraphasias is shown by the fact that open class words, and within that class, the nouns, are more afflicted by paraphasias than are their complements (closed class items) or quasi complements (verbs).

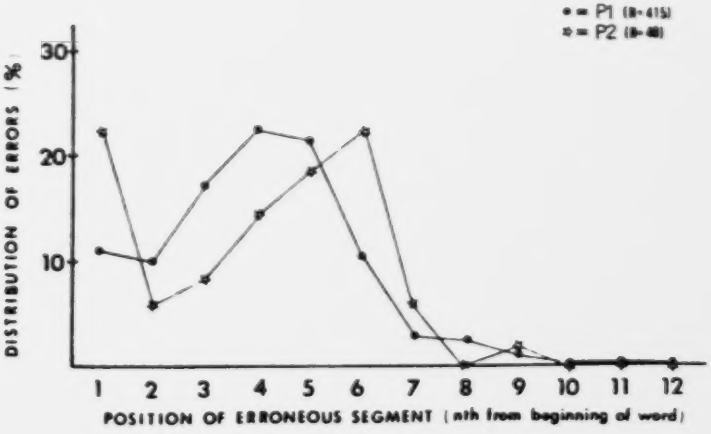
• = P1 (8·415)
* = P2 (8·48)
DISTRIBUTION OF ERRORS (%)
30
20
10
1 2 3 4 5 6 7 8 9 10 11 12
POSITION OF ERRONEOUS SEGMENT (nth from beginning of word)

Figure 1. Position of the erroneous segment within the word (in per cent).

BEST CO

In order to dwell into this question more directly we calculated the error rates of the stems and affixes in the present data. We selected the paraphasic words that contained an oblique case marker, a tense marker of verbs and/or a person marker in verbs. Since Speaker 1 (P1) had only a dozen of errors of these kind, we will discuss the larger data of P2. As regards his speech, the ratio of stem to suffix errors is 3.5 (Table 4). And it does not appear to differ from the expected stem to suffix ratio of 3.0. Hence we may tentatively conclude that, unlike true neologisms, phonological paraphasias are not sensitive to intra-word morphemic boundaries. Or, to put it differently still, the paraphasias tend to arise from processes that take place after the word formation rules have applied. However, the susceptibility of the phonological paraphasias to lexical classes (nouns vs. verbs), implies that these deviations do not arise from low level (apraxic) phonological processes, either. The model of language production that could be used as a theoretical point of reference here is an adaptation of Morris Halle's (Halle 1973) design that is discussed in connection with aphasic lexical errors by Buckingham (1981) (see Figure 2).

Table 4. Position of phonological paraphasias in words vis-à-vis morphemes.

	Position or Error (N)		Ratio of Errors	Ratio of
	Stem	Suffix	Stem to Suffix	Stem to Suffix
P1	50	15	3.3	3.0
P2	(7)	(4)	(1.7)	(2.8)

We also agree with Buckingham (op.cit.) when he claims that (pure) neologisms are most probably formed before the application of the word formation rules. Support for this conclusion can be found in the following type of observations (for English, see op.cit., for Finnish, see Niemi et al., forthcoming):

1) Also neologisms are selective as to the lexical class of the item.
2) The affixes, which usually are not formally deviant (see above), are most often inflectional rather than derivational.
3) Neologisms most often obey the morphophonological processes associated with affixation.

Y AVAILABLE

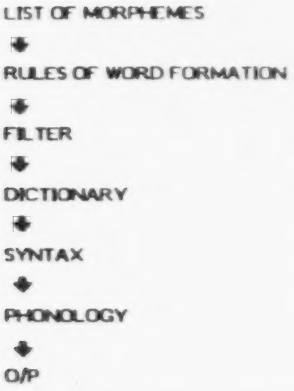

Figure 2. Word-Formation Model of Halle (1973) (adapted from Buckingham 1981).

3. MORPHOSYNTACTIC MARKING

The morphosyntactic marker errors of the present two speakers exhibit two type of observations. For the first, the Finnish cases arrange themselves in the following hierarchy in respect to their sensitivity to substitutions (the data is from Patient 1, who had a large amount of these type of errors, all in all 130 instances, or 7.1. per cent of case markers):

No. of Substitutions (in per cent)	Most								Least
	GEN	ALL	ELA	ILL	ADE	INE	ESS	PAR	NOM

If we analyze the net loss and gain rate for each surface case marker, it will be observed that we will obtain three groups viz. those of, real losers (genitive, allative, elative and illative, perhaps also adessive). The winners will be, as expected on the basis of language acquisition studies (see Toivainen 1980), the nominative and the partitive, while the essive, inessive (and perhaps adessive) will make up the

BEST C

intermediate group. The percentage values of the net loss and gain analysis are as follows (for details, see Niemi et al. forthcoming):

GEN	ALL	ELA	ILL	ADE	INE	EES	PAR	NOM
-16	-21	-9	-11	-5	-1	2	11	43

In other words, the almost total agreement between the two case marker "hierarchies" that we have here discussed will suggest that the errors tend to be unidirectional. In other words, a surface case category that is relatively often supplanted by another case suffix will not attract very many errors either. Moreover, the loss and gain hierarchy coincides quite well with the acquisition order of surface case markers in Finnish (see Toivainen, op.cit., esp. his Table 68). Furthermore, since we know that formally, i.e. phonologically and morphophonologically, the markers do not exhibit such striking differences that would explain the hierarchy, it may be that the loss and gain analysis, although it was performed on the surface markers only, also revealed some inherent, cognitive differences between the processing of some cases.

4. CONCLUDING REMARKS

To sum up, we will emphasize the low utility value of the traditional one-component views of phonology and would instead like to claim that the formal aspects of words can be maltreated at various stages of language production. And, as regards the morphosyntax of posterior aphasics, we hope to have shown that surface case marking does carry some consistent and theoretically interesting deviations.

Acknowledgements

We would like to thank Ritva Hänninen (Central Hospital of North Karelia) for providing the neuropsychological data of the present patients to us. The study has been financially supported by the Academy of Finland.

OPY AVAILABLE

References

Buckingham, H. 1981. Where do neologisms come from? In: Jargonaphasia, ed. by J. Brown. New York: Academic Press.

Buckingham, H. and Kertesz, A. 1976. Neologistic Jargon Aphasia. Amsterdam: Swets and Zeitlinger.

Butterworth, B. 1979. Hesitation and the production of verbal paraphasias and neologisms in jargon aphasia. Brain and Language 8: 133-162.

Butterworth, B. 1985. Jargon aphasia: Processes and strategies. In: Current Perspectives in Dysphasia, ed. by S. Newman and R. Epstein. Edinburgh: Churchill Livingstone.

Ellis, A., Miller, D. and Sin, G. 1983. Wernicke's aphasia and normal language processing: A case study in cognitive neuropsychology. Cognition 15: 111-144.

Goodglass, H. 1976. Agrammatism. In: Studies in Neurolinguistics. Vol. 1, ed. by H. Whitaker and H. Whitaker. New York: Academic Press.

Marin, O., Saffran, E. and Schwartz, M. 1976. Dissociations of language in aphasia: Implications for normal function. Annals of the New York Academy of Sciences 280: 868-884.

Niemi, J., Koivuselkä-Sallinen, P. and Hänninen, R. 1985. Phoneme errors in Broca's aphasia: Three Finnish cases. To appear in Brain and Language.

Niemi, J., Koivuselkä-Sallinen, P. and Hänninen, R. (forthcoming). Narrative language of Finnish posterior aphasics. To appear in Joensuu Papers in Neuropsychology and Neurolinguistics 2. University of Joensuu.

O'Connell, P. 1981. Neologistic jargon aphasia: A case report. Brain and Language 12: 292-302.

Toivainen, J. 1980. Inflectional Affixes Used by Finnish-speaking Children Aged 1-3 Years. Helsinki: Suomalaisen Kirjallisuuden Seura.

BEST COPY AVAILABLE